

Spreng. Syst. iv. Cur. Post. 343 (1827). *Sorbus Sargenti* Dippel, Handb. Laubholz. iii. 373 (1893), not *Pyrus Sargenti* (Rehder) Bean, Trees and Shrubs Hardy Brit. Isl. ii. 293 (1914).

P. DECORA (Sarg.) Hyland, var. **groenlandica** (Schneid.), comb. nov. *Sorbus americana* Marsh., var. *groenlandica* Schneid. in Bull. Herb. Boiss. sér. II, vi. 314 (1906). *S. decora*, var. *groenlandica* (Schneid.) G. N. Jones in Journ. Arn. Arb. xx. 30 (1939).

× *P. fallax* (Schneid.), comb. nov. *Sorbaronia fallax* Schneid. Handb. Laubholz. i. 676 (1904).

NAJAS MUENSCHERI AND OTHER SPECIES OF NAJAS IN EASTERN VIRGINIA

ROBERT T. CLAUSEN

Prof. Fernald (RHODORA 49: 105–106. 1947) has commented on the *Najas* found in the Virginian estuaries. Tentatively he has identified his and Mr. Long's collections as ? *N. flexilis*, *N. guadalupensis* and ? *N. gracillina*. The specimens which are the basis for these reports have been made available to me through the courtesy of Prof. Fernald. I report on them in the order as listed by him.

? "*N. flexilis* (Willd.) Rostk." Three collections are involved: Fernald and Long no. 12,520 from the Mattaponi River, King William County, and F. & L. nos. 12,523 and 13,214 from the Chickahominy River, New Kent and Charles City Counties respectively. These plants have the habit of *N. Muenscheri*. The styles are 0.5–1.2 mm. long. The seeds are slender, four to five times as long as wide, 2.2–2.6 mm. long and 0.4–0.5 mm. wide. Only a few seeds are so far available, making a detailed study of variation impossible. Seven mature seeds average 2.5 mm. in length. Seeds of *N. Muenscheri* in the Hudson River average 3.2 mm. in length with extremes of 2.4 and 4 mm., and extremes in width of 0.6–0.7 mm. The seeds of the collections from Virginia are lustrous, as in *N. flexilis*, but with very small areoles as in *N. Muenscheri*. These areoles often tend to be longer than wide, whereas in *N. flexilis* the majority of the areoles are as broad as long, also larger. Except for the length of the seeds, the Virginian specimens match the collection of Muenscher and Clausen no. 4273 from the mouth of the Mohawk River, Waterford, N. Y. The specimens from Waterford, with lustrous

seeds, 3–4 mm. long, were first identified as *N. flexilis* (Clausen, RHODORA 38: 333–345. 1936), then included under *N. Muenscheri* (Clausen, RHODORA 39: 57–60. 1937). Except that the largest seeds of the plants from Virginia are 0.4 mm. shorter than the smallest seeds from New York, the seeds are the same. S. S. Chase, who has been studying *Najas* cytologically, reports similar smooth-seeded plants of *N. Muenscheri* from two, possibly three, other localities in the Hudson Drainage (S. S. Chase, Preliminary studies in the genus *Najas* in the United States. A thesis presented to the faculty of the Graduate School of Cornell University, Feb., 1947.). In view of the fact that the three collections from Virginia are most similar to the lustrous-seeded *N. Muenscheri*, I now identify them as this species, even though an exact match of the Virginia and New York material is not possible. The smallest seed of *N. Muenscheri* yet found in the Hudson River, obtained from Muenscher and Curtis no. 5500 from Imbocht Bay, the type locality, is 2.4 mm. long, but the seed-coat is rough. The smooth, lustrous seeds so far collected in New York are all a trifle larger than the seeds of the plants from Virginia, but experience with other species of *Najas* indicates that considerable variation in size of seeds may occur. Prof. Fernald's original report of the plants from Virginia, on a postal received in September, 1940, was as *N. Muenscheri*. A superficial study by me in January, 1941, led to the conclusion that the specimens might be *N. flexilis*. Now, after careful study, I verify the conclusion that they are *N. Muenscheri*.

The discovery of *N. Muenscheri* in Virginia raises again the problem of the status of this species. Chase (*l. c.*) favors the possibility that it originated through hybridization, possibly involving three species as parents, namely *N. guadalupensis*, *N. gracillima* and *N. flexilis*. The first two are present in Virginia. The last still is not definitely known from the state, though it may yet be found and possibly did occur there in Pleistocene time. That our North American naiads had very different distributions in the glacial period seems reasonably certain. In 1941, Dr. W. C. Muenscher showed me some seeds of what appeared to be *N. Muenscheri* from a peat deposit in a lake in Louisiana. Unfortunately, no further data are available about these. Such occurrences, however, confirm the possibility of a hypothesis

such as that advanced by Chase, providing that we allow that perhaps the cross or crosses happened a long time ago. The population in the Hudson River seems fertile, self-perpetuating and well established. Less is known about the plants in Virginia. At least they are somewhat fertile. Until we know more about the details of reproduction and genetics concerning them, their designation, along with the plants from New York, as *N. Muenscheri*, seems reasonable. They can not with certainty be designated as hybrids of any two species. Instead, the plants from Virginia have lustrous, hard seed-coats as in *N. flexilis*, a feature not possessed by either of the associated species, *N. gracillima* and *N. guadalupensis*. Since available distributional data suggest that they do not constitute a geographical population of taxonomic significance, the specimens of *N. Muenscheri* with smooth, lustrous seeds are not now given nomenclatural status.

“*N. GUADALUPENSIS* (Spreng.) Morong.” My identification of the collections cited by Prof. Fernald is in agreement. The only comment necessary has to do with the citation of authors for the species. In my earlier writing on *Najas*, I followed the majority of American writers in citing Morong as the author of the binomial in *Najas*. This is incorrect. Magnus, in 1870, on p. viii of his “Beiträge zur Kenntniss der Gattung *Najas* L.”, combined *N. microdon* A. Br. and *N. guadalupensis* (Spreng.) (based on *Caulinia guadalupensis* Spreng.), using the latter name for the species. Since Morong’s publication in 1893 was 23 years later than that of Magnus, we should write the name as *Najas guadalupensis* (Spreng.) Magnus.

“?*N. GRACILLIMA* (A. Br.) Morong.” The specimens of Fernald and Long, nos. 12521, 13511, 13510, 13213 and 13512, from the Mattaponi River, Lacy Creek and the Chickahominy River, are robust, perhaps more so than those from elsewhere, but until I know what factors are responsible for this difference in texture of stems and to a lesser extent leaves, I hesitate to interpret the specimens as anything except *N. gracillima*. The coarser, heavier stems may be the result of environmental factors or, if genetical, might indicate contamination of the population of the Virginia coastal area with the characteristics of some other species. The stipular sheaths, mentioned by Prof. Fernald, impress me as

coming within the range of variation known for *N. gracillima*. The author of the binomial should be Magnus, not Morong, but the argument concerning this is a little more involved than under *N. guadalupensis*. The binomial, *N. gracillima*, appears several times in the text of the "Beiträge zur Kenntniss der Gattung Najas L." It occurs on p. 20, 23 and 24, but the bibliographical details for the basonym, necessary for valid publication, are lacking from those pages. On page vi, however, the necessary details for the basonym are available: "3) *Najas indica* var. *gracillima* Braun Msc. ist beschrieben in Manual of the botany of the northern United States by Asa Gray. Fifth Edition. New York 1868. pag. 681 in den Addenda." The explanation for recognition of *N. gracillima* as a species is given on page 24. My conclusion, reached in January, 1941, and maintained until now, is that credit for the combination *N. gracillima* (A. Br.) should be given to Magnus, since the name occurs several times in his text and since he clearly argues that the species is specifically distinct from *N. indica*. The citation and reference should be *N. gracillima* (A. Br.) Magnus, Beitr. kennt. Gatt. *Najas*, p. 20 (1870).

In summary, three species of *Najas* are known from Virginia. These are *N. gracillima*, *N. guadalupensis* and *N. Muenscheri*. *N. flexilis* may occur, but unquestionable specimens have not yet come to my attention.

DEPARTMENT OF BOTANY, CORNELL UNIVERSITY
Ithaca, New York.

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